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BYE-41947/65

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18 MAY 1965

MEMORANDUM FOR: Chief, Contracts Division, OSA

SUBJECT : Contractor Selection, IR Launch Detector

REFERENCE : BYE-4249-65 dated 19 April 1965

1. Investigation into the feasibility of an IR Launch Detector was started by Agency personnel during the spring of 1964. As a result of this investigation, it was decided to request proposals from various contractors having known capability in this specialized field. All potential contractors did not have necessary Agency or program clearances.

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[redacted] While a formal RFP was not generated, nor could it be generated, impartial and adequate requirement information was given to prospects within the security requirement.

2. During the spring of 1964, the following corporations were solicited for proposals, and documentation was received from them:

- a. HRB-Singer
State College, Pennsylvania
- b. Hughes Aircraft Co.
Culver City, California
(Two proposals received)
- c. EMR, Inc.
Sarasota, Florida
- d. Lockheed Aircraft Corporation
Burbank, California
- e. Baird-Atomic
(A basic proposal and a first and second modification were received)

The above proposals were partially evaluated by personnel of ORD, OSI, and OEL. A final evaluation was not reached. In the fall of 1964, the services of an outstanding IR researcher employed by IDA (Institute for Defense Analysis) were obtained to assist in a study of the problem and an evaluation of the proposals. A few weeks prior to this time, an Agency staff

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Page Two

member having experience with IR detection systems as utilized by the Air Force Systems Command was assigned as the developmental project officer.

3. In evaluating the proposals, the following criteria are of primary importance:

- a. Detection Altitude (penetration)
- b. False Target Discrimination
- c. Reliability
- d. Weight
- e. Schedule
- f. Power Consumption
- g. Technical Attributes vs. Cost
- h. Documentation

The above criteria are generally ranked by relative importance.

4. Evaluation Results

a. HRB-Singer (\$310,750)

Proposal lacks in penetration capability and false target discrimination. A two color system cannot discriminate afterburning jets from missiles due to fuel similarity. No data on false alarm rate, reliability, weight, or power consumption were presented. Schedule - good. Documentation - meager. Technical vs. Cost - marginal.

OVERALL RATING: Marginal

b. Hughes Aircraft Co. (\$1,400,000)

Penetration - good (4.3 micron). False target discrimination could be serious problem. No natural or man-made false target generators were analyzed. Reliability, weight, power consumption, and documentation data were not presented. Schedule - 15 mo. too long. Technical vs. Cost - unjustified.

OVERALL RATING: Unacceptable

c. EMR, Inc.

EMR, Inc. chose to propose utilization of the Ultra-Violet spectra. Work by DOD in the past ten years shows that this technique is not workable.

All UV detection projects have been dropped.

OVERALL RATING: Completely Unacceptable

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Page Three

d. Lockheed Aircraft Co. (\$318,000)

The fixed field detector proposed lacks detectivity over the field of view. Clouds and jets present high false alarm potential. Nothing on weight, reliability, power, and documentation was presented.

OVERALL RATING: Unacceptable

e. Baird Atomic (\$419,363)

Penetration - Adequate. False Alarm Technique - Very Marginal. Reliability and power consumption were not presented. Schedule - Reasonable. Documentation - Fair. Weight - 50-65 lbs. Technical vs. Cost - Good.

OVERALL RATING: Acceptable

f. The consensus was that of the five (5) proposals received in this period, the Baird Atomic approach presented the greatest probability of performing satisfactorily. The IDA consultant and the OEL Project Officer both were of the opinion that a contractor having good demonstrated capability in this field had not been solicited. The contractor was Aerojet General Corporation of Azusa, California. This was made known to OEL management, other OEL personnel, OSA personnel, and OSI personnel having an interest in this activity. At a Program Review Board meeting of the IR Launch Detector, facts concerning system requirements, climatological aspects of the geographic areas of interest, the results of proposal evaluation, and a recommendation that Aerojet General be solicited were presented. The Board concurred that Aerojet General should be contacted because of their prior demonstrated capability. The date of this particular meeting was in the latter part of January 1965.

Aerojet General was solicited by the Project Officer [redacted] and on 19 March 1965 received their proposal.

g. Aerojet General Corporation (\$550,000)
(One proposal plus one amendment)

Penetration and detection capability - very good.
False target discrimination - excellent techniques.

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Page Four

Reliability - reasonable prediction - redundant circuitry. Weight - 38 lbs. - very good. Power consumption - less than 100 watts - good. Documentation - excellent. Schedule - reasonable. Technical vs. Cost - good. Aerojet included the environmental test effort as well as system testing in their cost figure.

OVERALL RATING: Very Good

5. Conclusion

As indicated in paragraph 3 concerning evaluation criteria, a point of significant rank is false target discrimination. Aerojet General proposed three major methods of discrimination. They are threshold discrimination, plus-minus detector elements, and angular rate discrimination. In general, the targets which cannot be discriminated against by motion determination, will be discriminated by threshold techniques. This is possible because of the relatively low radiant intensity of low clouds and non-afterburning jets. These techniques (motion discrimination and threshold) have been verified in the proposal evaluation and appear to be feasible. The plus-minus detector pairs discriminate against extended areas of clouds and other extended surface radiators. Reliability, weight, power, penetration, schedule, and cost are all in the realm of realism and sufficient for mission requirements.

In regard to the Baird-Atomic proposal, it suffers most from the lack of a method for reducing false alarms to a rate consistent with mission requirements. Threshold discrimination together with an elementary one-scan delay logic circuit is proposed. A one-scan delay mechanism cannot discriminate the motion. If more than a one-scan delay were used, an alarm could result from false targets due to the nature of the decision logic. Reliability and power consumption were not estimated. Scheduling of the system was reasonable, but documentation was considered to be only fair.

On the basis of the above, the cited reference contained our recommendation for the selection of the Aerojet General Corporation for the award of the contract for the IR launch detector development. Special

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Page Five

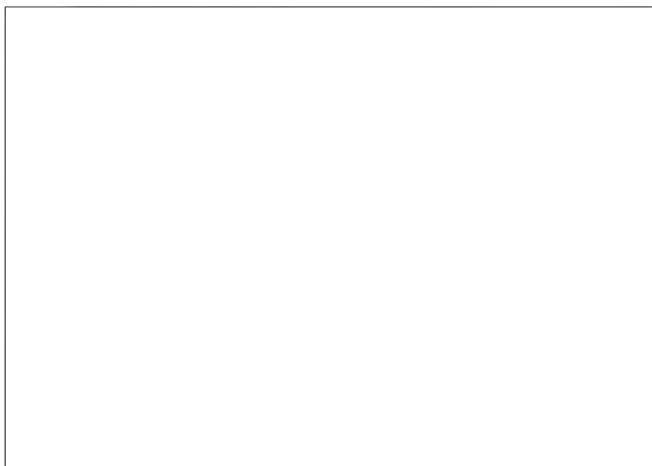
attention is made of the fact that contractor selection has been on a competitive basis, since equal information, within security requirements, has been made available to all prospects.



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Air Systems Division
OEL

CONCURRENCES:



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18 May 65
Date

24 May 65
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